Apprenticeship and Industry Training

Insulator

Apprenticeship Course Outline

3313 (2013)

Alberta

Apprenticeship and Industry Training

ALBERTA ENTERPISE AND ADVANCED EDUCATION

Insulator apprenticeship course outline.

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Course Outline

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Apprenticeship

Apprenticeship is post-secondary education with a difference. Apprenticeship begins with finding an employer. Employers hire apprentices, pay their wages and provide on-the-job training and work experience. Approximately 80 per cent of an apprentice's time is spent on the job under the supervision of a certified journeyperson or qualified tradesperson. The other 20 per cent involves technical training provided at, or through, a post-secondary institution – usually a college or technical institute.

To become certified journeypersons, apprentices must learn theory and skills, and they must pass examinations. Requirements for certification—including the content and delivery of technical training—are developed and updated by the Alberta Apprenticeship and Industry Training Board on the recommendation of Insulator Provincial Apprenticeship Committee.

The graduate of the Insulator apprenticeship program is a certified journeyperson who will be able:

- responsibly do all work tasks expected of a journeyperson
- supervise, train and coach apprentices
- demonstrate the installation, fitting, fabrication and attachment of insulation, finishing and weatherproofing materials to a high standard of workmanship
- use efficiently and safely all hand and power operated equipment used by the insulation industry
- read and correctly interpret blueprints, specifications and building codes
- thoroughly describe insulation materials and their uses
- describe all systems requiring insulation
- co-ordinate insulation work with other trades on the job site
- comply with all safety regulations of the construction industry
- perform assigned tasks in accordance with quality and production standards required by industry

Apprenticeship and Industry Training System

Industry-Driven

Alberta's apprenticeship and industry training system is an industry-driven system that ensures a highly skilled, internationally competitive workforce in more than 50 designated trades and occupations. This workforce supports the economic progress of Alberta and its competitive role in the global market. Industry (employers and employees) establishes training and certification standards and provides direction to the system through an industry committee network and the Alberta Apprenticeship and Industry Training Board. The Alberta government provides the legislative framework and administrative support for the apprenticeship and industry training system.

Alberta Apprenticeship and Industry Training Board

The Alberta Apprenticeship and Industry Training Board provides a leadership role in developing Alberta's highly skilled and trained workforce. The board's primary responsibility is to establish the standards and requirements for training and certification in programs under the Apprenticeship and Industry Training Act. The board also provides advice to the Minister of Advanced Education on the needs of Alberta's labour market for skilled and trained workers, and the designation of trades and occupations.

The thirteen-member board consists of a chair, eight members representing trades and four members representing other industries. There are equal numbers of employer and employee representatives.

Industry Committee Network

Alberta's apprenticeship and industry training system relies on a network of industry committees, including local and provincial apprenticeship committees in the designated trades, and occupational committees in the designated occupations. The network also includes other committees such as provisional committees that are established before the designation of a new trade or occupation comes into effect. All trade committees are composed of equal numbers of employer and employee representatives. The industry committee network is the foundation of Alberta's apprenticeship and industry training system.

Local Apprenticeship Committees (LAC)

Wherever there is activity in a trade, the board can set up a local apprenticeship committee. The board appoints equal numbers of employee and employer representatives for terms of up to three years. The committee appoints a member as presiding officer. Local apprenticeship committees:

- monitor apprenticeship programs and the progress of apprentices in their trade, at the local level
- make recommendations to their trade's provincial apprenticeship committee (PAC) about apprenticeship and certification in their trade
- promote apprenticeship programs and training and the pursuit of careers in their trade
- make recommendations to the board about the appointment of members to their trade's PAC
- help settle certain kinds of disagreements between apprentices and their employers
- carry out functions assigned by their trade's PAC or the board

Provincial Apprenticeship Committees (PAC)

The board establishes a provincial apprenticeship committee for each trade. It appoints an equal number of employer and employee representatives, and, on the PAC's recommendation, a presiding officer - each for a maximum of two terms of up to three years. Most PACs have nine members but can have as many as twenty-one. Provincial apprenticeship committees:

- Make recommendations to the board about:
    - standards and requirements for training and certification in their trade
    - courses and examinations in their trade
    - apprenticeship and certification
    - designation of trades and occupations
    - regulations and orders under the Apprenticeship and Industry Training Act
- monitor the activities of local apprenticeship committees in their trade
- determine whether training of various kinds is equivalent to training provided in an apprenticeship program in their trade
- promote apprenticeship programs and training and the pursuit of careers in their trade
- consult with other committees under the Apprenticeship and Industry Training Act about apprenticeship programs, training and certification and facilitate cooperation between different trades and occupations
- consult with organizations, associations and people who have an interest in their trade and with employers and employees in their trade
- may participate in resolving certain disagreements between employers and employees
- carry out functions assigned by the board

Insulator PAC Members at the Time of Publication

Mr. D. Paul	Red Deer	Presiding Officer
Mr. J. Weber	Calgary	Employer
Mr. W. Boys	Calgary	Employer
Mr. J. Archer	Calgary	Employer
Mr. B. Aquila	Edmonton	Employer
Ms. C. Smith	Edmonton	Employee
Mr. R. Milich	Edmonton	Employee
Mr. L. Reid	Edmonton	Employee
Mr. R. Robertson	Calgary	Employee

Alberta Government

Alberta Advanced Education works with industry, employer and employee organizations and technical training providers to:

- facilitate industry's development and maintenance of training and certification standards
- provide registration and counselling services to apprentices and employers
- coordinate technical training in collaboration with training providers
- certify apprentices and others who meet industry standards

Technical Institutes and Colleges

The technical institutes and colleges are key participants in Alberta's apprenticeship and industry training system. They work with the board, industry committees and Alberta Advanced Education to enhance access and responsiveness to industry needs through the delivery of the technical training component of apprenticeship programs. They develop lesson plans from the course outlines established by industry and provide technical training to apprentices.

Apprenticeship Safety

Safe working procedures and conditions, incident/injury prevention, and the preservation of health are of primary importance in apprenticeship programs in Alberta. These responsibilities are shared and require the joint efforts of government, employers, employees, apprentices and the public. Therefore, it is imperative that all parties are aware of circumstances that may lead to injury or harm.

Safe learning experiences and healthy environments can be created by controlling the variables and behaviours that may contribute to or cause an incident or injury. By practicing a safe and healthy attitude, everyone can enjoy the benefit of an incident and injury free environment.

Alberta Apprenticeship and Industry Training Board Safety Policy

The Alberta Apprenticeship and Industry Training Board (board) fully supports safe learning and working environments and emphasizes the importance of safety awareness and education throughout apprenticeship training- in both on-the- job training and technical training. The board also recognizes that safety awareness and education begins on the first day of on-the-job training and thereby is the initial and ongoing responsibility of the employer and the apprentice as required under workplace health and safety training. However the board encourages that safe workplace behaviour is modeled not only during on-the-job training but also during all aspects of technical training, in particular, shop or lab instruction. Therefore the board recognizes that safety awareness and training in apprenticeship technical training reinforces, but does not replace, employer safety training that is required under workplace health and safety legislation.

The board has established a policy with respect to safety awareness and training:

> **The board promotes and supports safe workplaces, which embody a culture of safety for all apprentices, employers and employees. Employer required safety training is the responsibility of the employer and the apprentice, as required under legislation other than the *Apprenticeship and Industry Training Act*.**

The board's complete document on its 'Apprenticeship Safety Training Policy' is available at www.tradesecrets.alberta.ca; access the website and conduct a search for 'safety training policy'.

Implementation of the policy includes three common safety learning outcomes and objectives for all trade course outlines. These common learning outcomes ensure that each course outline utilizes common language consistent with workplace health and safety terminology. Under the title of 'Standard Workplace Safety', this first section of each trade course outline enables the delivery of generic safety training; technical training providers will provide trade specific examples related to the content delivery of course outline safety training.

Occupational Health and Safety

A tradesperson is often exposed to more hazards than any other person in the work force and therefore should be familiar with and apply the Occupational Health and Safety Act, Regulations and Code when dealing with personal safety and the special safety rules that apply to all daily tasks.

Occupational Health and Safety (a division of Alberta Human Services) conducts periodic inspections of workplaces to ensure that safety regulations for industry are being observed.

Additional information is available at www.humanservice.alberta.ca

Technical Training

Apprenticeship technical training is delivered by the technical institutes and many colleges in the public post-secondary system throughout Alberta. The colleges and institutes are committed to delivering the technical training component of Alberta apprenticeship programs in a safe, efficient and effective manner. All training providers place great emphasis on safe technical practices that complement safe workplace practices and help to develop a skilled, safe workforce.

The following institutions deliver Insulator apprenticeship technical training:

Northern Alberta Institute of Technology
Southern Alberta Institute of Technology

Procedures for Recommending Revisions to the Course Outline

Advanced Education has prepared this course outline in partnership with the Insulator Provincial Apprenticeship Committee.

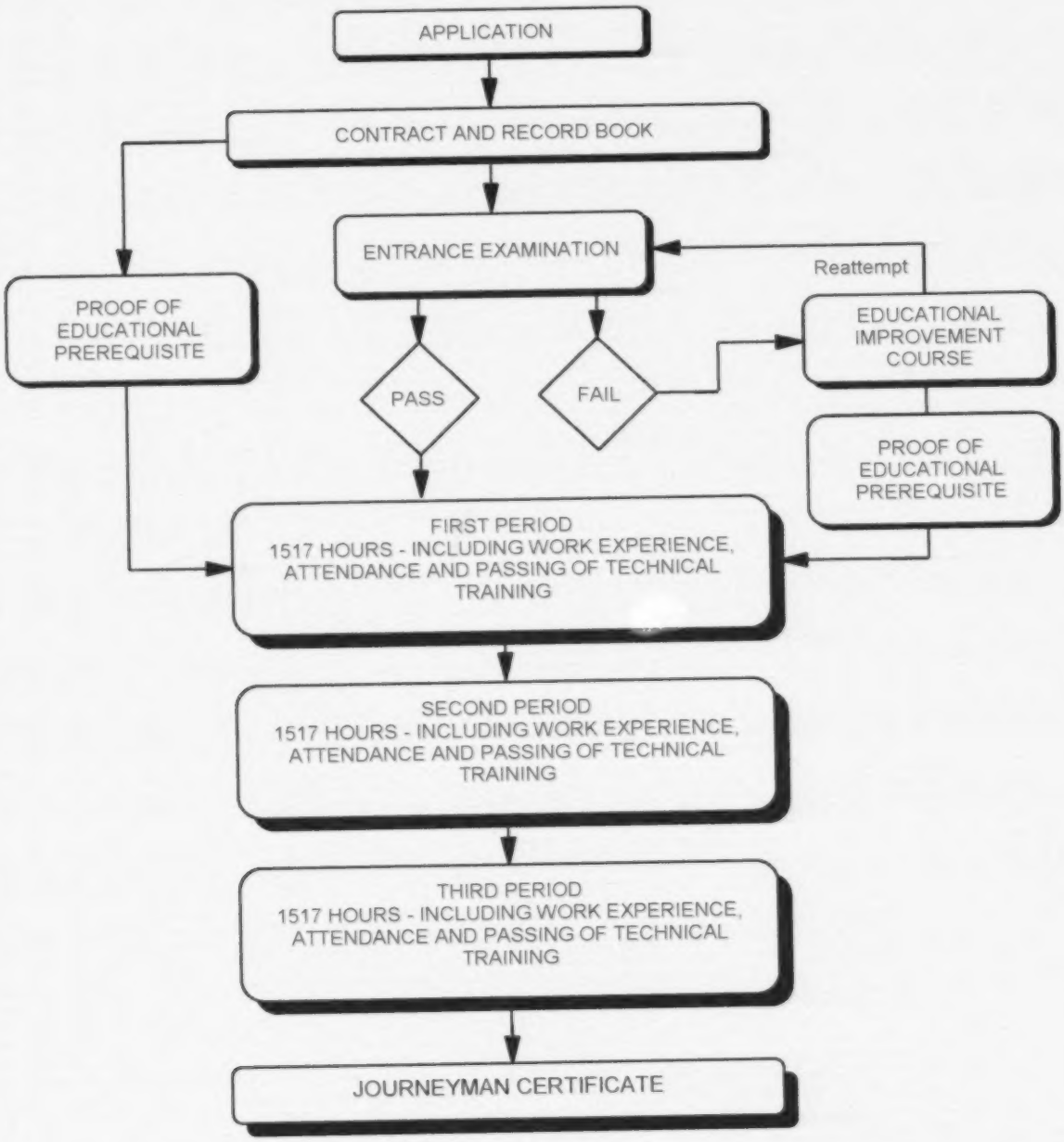
This course outline was approved on December 14, 2012 by the Alberta Apprenticeship and Industry Training Board on a recommendation from the Provincial Apprenticeship Committee. The valuable input provided by representatives of industry and the institutions that provide the technical training is acknowledged.

Any concerned individual or group in the province of Alberta may make recommendations for change by writing to:

Insulator Provincial Apprenticeship Committee
c/o Industry Programs and Standards
Apprenticeship and Industry Training
Advanced Education
10th floor, Commerce Place
10155 102 Street NW
Edmonton AB T5J 4L5

It is requested that recommendations for change refer to specific areas and state references used. Recommendations for change will be placed on the agenda for regular meetings of the Insulator Provincial Apprenticeship Committee.

Apprenticeship Route toward Certification


APPLICATION
CONTRACT AND RECORD BOOK
ENTRANCE EXAMINATION
Reattempt
PROOF OF EDUCATIONAL PREREQUISITE
PASS
FAIL
EDUCATIONAL IMPROVEMENT COURSE
PROOF OF EDUCATIONAL PREREQUISITE
FIRST PERIOD
1517 HOURS - INCLUDING WORK EXPERIENCE, ATTENDANCE AND PASSING OF TECHNICAL TRAINING
SECOND PERIOD
1517 HOURS - INCLUDING WORK EXPERIENCE, ATTENDANCE AND PASSING OF TECHNICAL TRAINING
THIRD PERIOD
1517 HOURS - INCLUDING WORK EXPERIENCE, ATTENDANCE AND PASSING OF TECHNICAL TRAINING
JOURNEYMAN CERTIFICATE

Insulator Training Profile
FIRST PERIOD
(7 Weeks 30 Hours per Week – Total of 210 Hours)

SECTION ONE

STANDARD & SPECIFIC WORKPLACE SAFETY
42 HOURS

A	B	C
Safety Legislation, Regulations & Industry Policy in the Trades – 6 Hours	Climbing, Lifting, Rigging & Hoisting – 4 Hours	Hazardous Materials & Fire Protection – 4 Hours
D	**E**	**F**
Apprenticeship & Industry Training Orientation – 2 Hours	Safety and Noise Control – 8 Hours	Asbestos Awareness – 18 Hours

SECTION TWO

ACCESSORIES, TOOLS & EQUIPMENT
56 HOURS

A	B	C
Adhesives, Mastics and Cements – 12 Hours	Insulation Fittings – 14 Hours	Insulation Fasteners – 4 Hours
D	**E**	**F**
Insulation Finishes – 7 Hours	Trade Tools and Shop Equipment – 8 Hours	Material Handling – 3 Hours
G		
Stud Welders – 8 Hours		

SECTION THREE

HOT &COLD APPLICATIONS
32 HOURS

A	B	C
Ceramic Fibers – 2 Hours	Extruded Foam Plastic – 10 Hours	Polystyrenes – 10 Hours
D		
Calcium Silicate – 10 Hours		

SECTION FOUR

DUAL TEMPERATURE APPLICATIONS
38 HOURS

A	B	C
Mineral Wool – 8 Hours	Fiberglass – 15 Hours	Cellular Glass – 9 Hours
D	**E**	
Polyurethane – 3 Hours	Nano Fiber – 3 Hours	

SECTION FIVE

MATH & BLUEPRINT LEVEL ONE
42 HOURS

A	B	C
Applied Mathematics – 8 Hours	Perimeters and Areas – 13 Hours	Blueprint Fundamentals – 8 Hours
D	**E**	
Types of Drawings – 8 Hours	Division of Blueprints – 5 Hours	

SECOND PERIOD
(7 Weeks 30 Hours per Week – Total of 210 Hours)

SECTION ONE

CANVAS ON INSULATED PIPING, DUCTS AND EQUIPMENT
54 HOURS

- **A** — Canvas-Surface Preparation — 17 Hours
- **B** — Canvas Applications — 37 Hours

SECTION TWO

PATTERN LAYOUT LEVEL ONE & COVERINGS
59 HOURS

- **A** — Pattern Development — 29 Hours
- **B** — PVC Surface Preparation — 4 Hours
- **C** — PVC Applications — 20 Hours
- **D** — Metal Application — 6 Hours

SECTION THREE

SPECIALIZED APPLICATIONS LEVEL ONE
39 HOURS

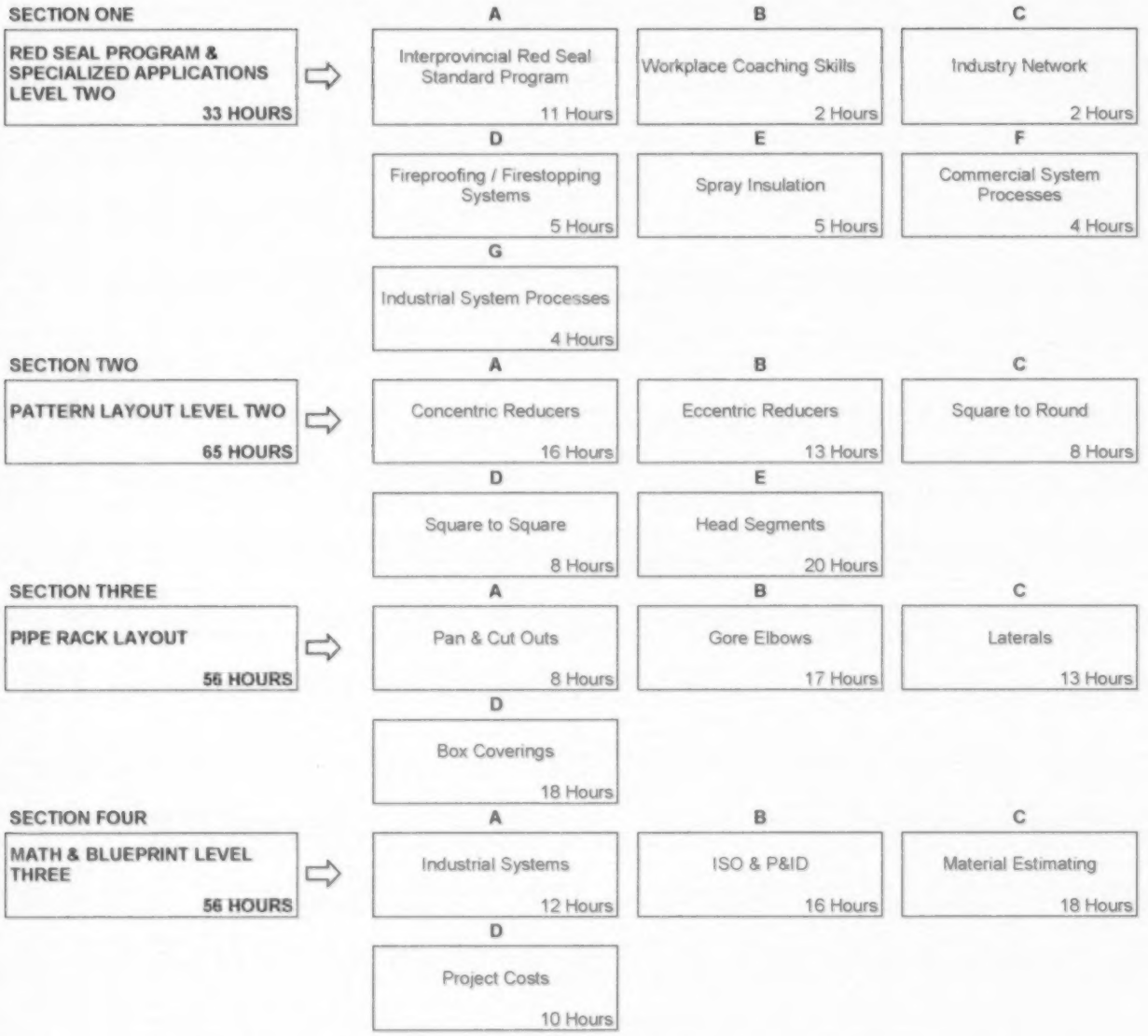
- **A** — Lag Applications — 15 Hours
- **B** — Extruded Foam Elbows — 7 Hours
- **C** — Extruded Foam Reducers — 7 Hours
- **D** — Underground Systems — 2 Hours
- **E** — Heat Loss Detection — 2 Hours
- **F** — Soundproofing — 4 Hours
- **G** — Building Insulation & Air Barriers — 2 Hours

SECTION FOUR

MATH & BLUEPRINT LEVEL TWO
58 HOURS

- **A** — Insulating Material Quantities — 7 Hours
- **B** — Finish Material Quantities — 7 Hours
- **C** — Lags — 14 Hours
- **D** — Orthographic & Isometric Drawings — 15 Hours
- **E** — Commercial Systems — 15 Hours

THIRD PERIOD
(7 Weeks 30 Hours per Week – Total of 210 Hours)



NOTE: The hours stated are for guidance and should be adhered to as closely as possible. However, adjustments must be made for rate of apprentice learning, statutory holidays, registration and examinations for the training establishment and Apprenticeship and Industry Training.

FIRST PERIOD TECHNICAL TRAINING
INSULATOR TRADE
COURSE OUTLINE

UPON SUCCESSFUL COMPLETION OF THIS PROGRAM THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.

SECTION ONE: ..... STANDARD & SPECIFIC WORKPLACE SAFETY ..... 42 HOURS

A. Safety Legislation, Regulations & Industry Policy in the Trades .....6 Hours

Outcome: ***Describe legislation, regulation and practices intended to ensure a safe work place in this trade.***

1. Demonstrate the ability to apply the Occupational Health and Safety Act, Regulation and Code.
2. Explain the role of the employer and employee in regard to Occupational Health and Safety (OH&S) regulations, Worksite Hazardous Materials Information Systems (WHMIS), fire regulations, Workers Compensation Board regulations, and related advisory bodies and agencies.
3. Explain industry practices for hazard assessment and control procedures.
4. Describe the responsibilities of workers and employers to apply emergency procedures.
5. Describe positive tradesperson attitudes with respect to housekeeping, personal protective equipment and emergency procedures.
6. Describe the roles and responsibilities of employers and employees with respect to the selection and use of personal protective equipment (PPE).
7. Select, use and maintain appropriate PPE for worksite applications.

B. Climbing, Lifting, Rigging & Hoisting .....4 Hours

Outcome: ***Describe the use of personal protective equipment (PPE) and safe practices for climbing, lifting, rigging and hoisting in this trade.***

1. Select, use and maintain specialized PPE for climbing, lifting and load moving equipment.
2. Describe manual lifting procedures using correct body mechanics.
3. Describe rigging hardware and the safety factor associated with each item.
4. Select the correct equipment for rigging typical loads.
5. Describe hoisting and load moving procedures.

C. Hazardous Materials & Fire Protection .....4 Hours

Outcome: ***Describe the safety practices for hazardous materials and fire protection in this trade.***

1. Describe the roles, responsibilities features and practices related to the workplace hazardous materials information system (WHMIS) program.
2. Describe the three key elements of WHMIS.
3. Describe handling, storing and transporting procedures when dealing with hazardous material.
4. Describe safe venting procedures when working with hazardous materials.
5. Describe fire hazards, classes, procedures and equipment related to fire protection.

D. Apprenticeship and Industry Training Orientation ..... 2 Hours

Outcome: Describe the Alberta Apprenticeship system.

1. Identify the training profile of the Insulator Apprenticeship in Alberta.
2. Explain the Insulator program course outline learning outcomes and objectives.
3. Discuss the contents of the apprenticeship training Record Book.
4. Describe the responsibilities for the Contract of Apprenticeship by the apprentice, employer and Alberta Apprenticeship and Industry Training.
5. Identify industrial, commercial and residential fields that provide opportunities for Insulators.

E. Safety and Noise Control ..... 8 Hours

Outcome: Perform safe work procedures pertaining to noise control.

1. Identify the physical hazards that are common to the Industry.
2. Outline OH&S regulations relevant to noise control.
3. Recognize the different types and applications of hearing protection.
4. Recognize the procedures and applications during hot and cold exposure.
5. Describe the safety practises taken during hot and cold exposure.

F. Asbestos Awareness ..... 18 Hours

Outcome: Perform industry practiced abatement procedural methods of control.

1. Identify the certification requirements for asbestos workers.
2. Identify the different types of asbestos.
3. Describe the health effects associated to exposure to asbestos.
4. Outline OH&S regulations relevant to asbestos removal.
5. Describe methods of asbestos abatement in the industry:
6. List equipment, materials, and safety accessories.
7. List worksite planning procedures and safety.
8. List clean-up procedures and final inspection practices.
9. Make use of asbestos removal tools & equipment.

SECTION TWO: ..... ACCESSORIES, TOOLS AND EQUIPMENT ..... 56 HOURS

A. Adhesives, Mastics and Cements ..... 12 Hours

Outcome: Prepare surfaces to allow the application of adhesives, cements and mastics.

1. Identify the different types of adhesives, cements and mastics.
2. Identify the different types of reinforcing materials.
3. Describe the surface preparation for adhesives, cements and mastics.
4. Describe the application methods of adhesives, cements and mastics.
5. Prepare a surface for an adhesive, cement or mastic.
6. Apply an adhesive, cement or mastic to a surface.

B. Insulation Fittings ..... 14 Hours

Outcome: Install miters, elbows, tees and lateral type fittings.

1. Identify the common types of insulation fittings.
2. Identify long and short radius elbow fittings.
3. Describe the fabrication methods of insulation fittings.
4. Fabricate common types of insulation fittings.
5. Install common types of insulation fittings on a shop project.

C. Insulation Fasteners ..... 4 Hours

Outcome: Install common types of insulation fasteners.

1. Identify the general types of insulation fasteners.
2. Outline preparation and application procedures for insulation fasteners.
3. Install insulation fasteners on a shop project.

D. Insulation Finishes ..... 7 Hours

Outcome: Recognize PVC, canvas, and metal type finishes.

1. Identify the applications of common types of finishes.
2. Describe the types of finishes.
3. Recognize the health risks associated when working with insulation finishes.
4. Identify the applications of pre-formed type fittings.
5. Identify the applications of vapour barrier type materials.
6. Apply general types of finishes.

E. Trade Tools and Shop Equipment ..... 8 Hours

Outcome: Operate and maintain tools and shop equipment used in the trade.

1. Identify the different types of hand & power tools and shop equipment used in the trade.
2. Describe the different types of hand &power tools and shop equipment used in the trade.
3. Operate hand & power tools and shop equipment used in the trade.

F. Material Handling ..... 3 Hours

Outcome: Perform the methods of material handling.

1. Identify the different methods of material handling.
2. Outline the proper storage procedures of material.
3. Perform the different methods of handling insulating material.

G. Stud Welders ..... 8 Hours

Outcome: Operate a stud welder.

1. Identify frequent types of fasteners used with stud welders.
2. List the set-up procedures for a stud welder.

3. Perform the set-up procedures for a stud welder.
4. Operate a stud welder.

SECTION THREE: .....HOT & COLD APPLICATIONS.....32 HOURS

A. Ceramic Fibers .....2 Hours

Outcome: Install ceramic fiber insulation.

1. Identify the applications of ceramic fibers.
2. Recognize the health risks associated when exposed to ceramic fibers.

B. Extruded Foam Plastic .....10 Hours

Outcome: Install extruded foam plastic insulation.

1. Identify the applications of extruded foam plastic.
2. Recognize the health risks associated when exposed to extruded foam plastic.
3. Apply extruded foam plastic on a shop project.

C. Polystyrenes.....10 Hours

Outcome: Install polystyrene insulation.

1. Identify the applications of polystyrenes.
2. Recognize health risks associated when exposed to polystyrenes.
3. Apply polystyrene on a shop project.

D. Calcium Silicate .....10 Hours

Outcome: Install calcium silicate.

1. Identify the applications of calcium silicate.
2. Recognize health risks associated when exposed to calcium silicate.
3. Apply calcium silicate on a shop project.

SECTION FOUR: .....DUAL TEMPERATURE APPLICATIONS.....38 HOURS

A. Mineral Wool.....8 Hours

Outcome: Install mineral wool insulation.

1. Identify the applications of mineral wool.
2. Recognize the health risks associated when exposed to mineral wool.
3. Apply mineral wool to a shop project.

B. Fiberglass .....15 Hours

Outcome: Install fiberglass insulation.

1. Identify the applications of fibreglass.
2. Recognize the health risks associated when exposed to fiberglass.
3. Apply fiberglass insulation on a shop project.

C. Cellular Glass ..... 9 Hours

Outcome: Install cellular glass insulation.

1. Identify the applications of cellular glass.
2. Recognize health risks associated when exposed to cellular glass.
3. Apply cellular glass on a shop project.

D. Polyurethane ..... 3 Hours

Outcome: Install polyurethane insulation.

1. Identify the applications of polyurethanes.
2. Recognize the health risks associated when exposed to polyurethanes.
3. Apply polyurethane on a shop project.

E. Nano Fibers ..... 3 Hours

Outcome: Install Nano fiber type insulation.

1. Identify the applications of nano fibers.
2. Recognize the health risks associated when exposed to nano fibers.
3. Outline the recommended handling procedures of nano fibers.

SECTION FIVE: ..... MATH & BLUEPRINT LEVEL 1 ..... 42 HOURS

A. Applied Mathematics ..... 8 Hours

Outcome: Solve basic mathematical problems.

1. Describe the basic calculator functions and operations.
2. Perform basic math calculations using whole numbers, fractions and decimals.
3. Perform number and measurement conversions using whole numbers, fractions and decimals.
4. Perform the order of operations known as BEDMAS.
5. Convert measurements between metric and imperial.
6. Calculate right angle problems using the Pythagorean Theorem.

B. Perimeters and Areas ..... 13 Hours

Outcome: Calculate geometric perimeter and areas using applicable formulas.

1. Identify the general geometric formulas to calculate perimeter.
2. Identify the general geometric formulas to calculate area.
3. Solve geometric surface areas by combining the applicable formulas.

C. Blueprint Fundamentals ..... 8 Hours

Outcome: Apply the skills in practicing the use of measurement scales, lines, symbols and pipe sizes.

1. Identify the different types of pipe sizes.
2. Explain the different architectural symbols and lines.

3. Identify the different types of scale rulers.
4. Perform measuring type exercises using scale rulers.

D. Types of Drawings ..... 8 Hours

Outcome: Prepare basic orthographic drawings.

1. Define the term pictorial drawing.
2. Define the term orthographic drawing.
3. Draw basic orthographic drawings.

E. Divisions of Blueprints ..... 5 Hours

Outcome: Recognize the divisions of a blueprint.

1. Identify the use of divisions in blueprints.
2. Describe the divisions in blueprints.
3. Apply the divisions in blueprints corresponding to shop drawings.

SECOND PERIOD TECHNICAL TRAINING
INSULATOR TRADE
COURSE OUTLINE

UPON SUCCESSFUL COMPLETION OF THIS PROGRAM THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.

SECTION ONE: ..... CANVAS ON INSULATED PIPING, DUCTS AND EQUIPMENT ..... 54 HOURS

A. Canvas Surface Preparation ..... 17 Hours

Outcome: Prepare canvas surface on piping, ducts and equipment.

1. Identify the applications of canvas surface preparation.
2. Recognize the health risks associated when preparing surfaces for canvas.
3. Outline the preparation procedures for canvas.
4. Prepare the surface for a canvas shop project(s).

B. Canvas Applications ..... 37 Hours

Outcome: Install canvas on piping, ducting and equipment.

1. Identify the purposes of canvas application.
2. Recognize the health risks associated when applying canvas.
3. Outline the application procedures when applying canvas.
4. Apply canvas on shop project(s).

SECTION TWO: ..... PATTERN LAYOUT LEVEL ONE & COVERINGS ..... 59 HOURS

A. Pattern Development ..... 29 Hours

Outcome: Install end caps, tees and bevels.

1. Identify the types of finish fittings.
2. Describe the setup of drafting layout tools.
3. Describe the methods of line and circle division.
4. Perform the layout procedure to produce common finish fittings.
5. Fabricate common types of finish fittings.

B. PVC Surface Preparation ..... 4 Hours

Outcome: Prepare a surface for installing PVC on insulated pipe.

1. Identify the applications of PVC surface preparation.
2. Recognize the health risks when preparing surfaces for PVC.
3. Outline the preparation procedures for PVC.
4. Prepare the surface for PVC on a shop project(s).

C. PVC Application ..... 20 Hours

Outcome: Install PVC on insulated pipe.

1. Identify the purposes of PVC application.
2. Recognize the health risks when applying PVC.
3. Outline the application procedures when applying PVC.
4. Apply PVC on a shop project(s).

D. Metal Application ..... 6 Hours

Outcome: Install metal on insulated pipe.

1. Identify the fundamental purposes of metal application.
2. Outline the application procedures when applying metal.
3. Install metal finish fittings on a shop project(s).

SECTION THREE: .....SPECIALIZED APPLICATIONS LEVEL ONE ..... 39 HOURS

A. Lag Applications ..... 15 Hours

Outcome: Install lags on pre-insulated equipment.

1. Identify the types of materials used for fabricating lags.
2. Refer to a working drawing to develop a lag layout.
3. Determine inside/outside lag sizes to verify the number of lags.
4. Perform the procedure in fabricating lags.
5. Perform the procedure when installing lags.

B. Extruded Foam Elbows ..... 7 Hours

Outcome: Install extruded foam elbows.

1. Identify the applications that use extruded foam elbows.
2. Outline the layout process for extruded foam elbows.
3. Describe how to fabricate an extruded foam elbow.
4. Install an extruded foam elbow on a shop project.

C. Extruded Foam Reducers ..... 7 Hours

Outcome: Install extruded foam reducers.

1. Identify applications that utilize extruded foam reducers.
2. Outline the layout process for extruded foam reducers.
3. Fabricate an extruded foam reducer.
4. Install an extruded foam reducer on a shop project.

D. Underground Systems ..... 2 Hours

Outcome: Install insulation on underground systems.

1. Identify the different types of systems used in underground insulation.
2. Recognize the health risks associated when working with underground systems.

E. Heat Loss Detection ..... 2 Hours

Outcome: Recognize the methods of heat loss detection.

1. Identify the principles of heat loss detection.
2. Describe the concepts of thermography.

F. Soundproofing ..... 4 Hours

Outcome: Install soundproofing systems.

1. Identify the different types of soundproofing systems.
2. Outline the installation methods for soundproof systems.
3. Install a soundproof system on a shop project.

G. Building Insulation and Air Barriers ..... 2 Hours

Outcome: Recognize insulation and air barrier systems, materials and their application.

1. Identify the different types of insulation and their characteristics.
2. Describe insulation techniques for foundations.
3. Describe the assembly methods for different types of air barrier systems.

SECTION FOUR: .....MATH & BLUEPRINT LEVEL 2 ..... 58 HOURS

A. Insulating Material Quantities ..... 7 Hours

Outcome: Calculate the amount of insulating material required.

1. Calculate insulation material quantities for rectangular ducts.
2. Calculate insulation material quantities for round ducts.
3. Calculate insulation material quantities for equipment.

B. Finish Material Quantities ..... 7 Hours

Outcome: Calculate the amount of finish material required.

1. Calculate finish material quantities for rectangular ducts.
2. Calculate finish material quantities for round ducts.
3. Calculate finish material quantities for equipment.

C. Lags ..... 14 Hours

Outcome: Calculate lag sizes and quantities to determine the required amount of rigid board insulation.

1. Perform calculation to determine lag sizes.
2. Perform calculation to determine lag quantities.
3. Calculate the required board feet of rigid insulation.

D. Orthographic and Isometric Drawings ..... 15 Hours

Outcome: ***Prepare orthographic and isometric drawings.***

1. Identify orthographic and isometric type of drawings.
2. Interpret orthographic and isometric type of drawings.
3. Draw an orthographic drawing.
4. Draw an isometric drawing.
5. Convert between isometric and orthographic pipe/ duct drawings.

E. Commercial Systems ..... 15 Hours

Outcome: ***Interpret mechanical drawings and symbols in a commercial system.***

1. Identify the symbols within mechanical drawings for a commercial system.
2. Describe the processes of a commercial system.
3. Identify the divisions of blueprints and how they relate to specifications and addendums in a commercial system.

THIRD PERIOD TECHNICAL TRAINING
INSULATOR TRADE
COURSE OUTLINE

UPON SUCCESSFUL COMPLETION OF THIS PROGRAM THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.

SECTION ONE:.....RED SEAL PROGRAM & SPECIALIZED APPLICATIONS LEVEL TWO ..... 33 HOURS

A. Interprovincial Red Seal Standards Program ..... 11 Hours

Outcome: Use Red Seal products to challenge an Interprovincial examination.

1. Identify Red Seal products used to develop Interprovincial examinations.
2. Use Red Seal products to prepare for an Interprovincial examination.

B. Workplace Coaching Skills ..... 2 Hours

Outcome: Display Coaching Skills.

1. Describe coaching skills used for training apprentices.

C. Industry Network ..... 2 Hours

Outcome: Describe the industry network.

1. Describe Alberta's apprenticeship and industry training system.
2. Describe the roles and responsibilities of the Alberta Apprenticeship and Industry Training Board, government and post-secondary institutions.
3. Describe the roles and responsibilities of the Provincial Apprenticeship Committees , Local Apprenticeship Committees, and Occupational Committees

D. Fireproofing/ Firestopping Systems ..... 5 Hours

Outcome: Recognize the importance of fireproofing and firestopping systems.

1. Define the terms fireproofing and firestopping systems.
2. Describe the materials that are used in fireproofing and firestopping.
3. Identify areas where fireproofing and firestopping are required in a building system.
4. Recognize the codes and regulations that pertain to fireproofing and firestopping.

E. Spray Insulation ..... 5 Hours

Outcome: Recognize the various applications of various spray applications.

1. Define the term spray insulation.
2. Identify the material, equipment and substrate for spray insulation.
3. Recognize the codes and regulations that pertain to spray insulation.

F. Commercial System Processes ..... 4 Hours

Outcome: Understand commercial process systems.

1. Identify the components of a commercial process system.
2. Describe the components of a commercial process system.

3. Describe the materials used in a commercial process system.

G. Industrial System Processes ..... 4 Hours

Outcome: Understand industrial process systems.

1. Identify the components of an industrial process system.
2. Describe the components of an industrial process system.
3. Describe the materials used in an industrial process system.
4. Describe the purpose and application of expansion joints.

SECTION TWO: ..... PATTERN LAYOUT LEVEL TWO ..... 65 HOURS

A. Concentric Reducers ..... 16 Hours

Outcome: Install a concentric reducer.

1. Define the term concentric reducer.
2. Describe how patterns are developed for a concentric reducer.
3. Outline the layout process for concentric reducers.
4. Fabricate a concentric reducer.
5. Install a concentric reducer on a shop project.

B. Eccentric Reducers ..... 13 Hours

Outcome: Install an eccentric reducer.

1. Define the term eccentric reducer.
2. Describe how patterns are developed for an eccentric reducer.
3. Outline the layout process for eccentric reducers.
4. Fabricate an eccentric reducer.
5. Install an eccentric reducer on a shop project.

C. Square to Round ..... 8 Hours

Outcome: Install a square to round transition.

1. Define the term square-to-round transition.
2. Describe how patterns are developed for square-to-round transition.
3. Outline the layout process for a square-to-round transition.
4. Fabricate a square-to-round transition.
5. Install a square-to-round transition on a shop project.

D. Square to Square ..... 8 Hours

Outcome: Install square to square transition.

1. Define the term square-to-square transition.
2. Describe how patterns are developed for a square-to-square transition.
3. Outline the layout process for a square-to-square transition.

4. Fabricate a pattern for a square-to-square transition.
5. Install a square-to-square transition on a shop project.

E. Head Segments ..... 20 Hours

Outcome: Install finish on head segments.

1. Define the term spherical head.
2. Define the term elliptical head.
3. Describe how patterns are developed by using the chalkline method.
4. Describe how patterns are developed by using the geometric method.
5. Outline the layout process to develop patterns using the geometric method.
6. Fabricate a finish pattern for a head segment.
7. Install a finish on a head segment.

SECTION THREE: ..... PIPE RACK LAYOUT ..... 56 HOURS

A. Pan & Cut Outs ..... 8 Hours

Outcome: Perform a pan out and cut out for obstructions.

1. Define the terms cut out and pan out.
2. Identify the different applications for pan outs and cut outs.
3. Outline the layout process to complete a cut out.
4. Fabricate a pan out and install on a shop project.

B. Gore Elbows ..... 17 Hours

Outcome: Install common types of elbows.

1. Define the term gore elbow.
2. Define the term butterfly elbow.
3. Outline the layout process in developing patterns for a gore elbow.
4. Outline the layout process in developing patterns for a butterfly elbow.
5. Layout and install common types of elbows on a shop project.

C. Laterals ..... 13 Hours

Outcome: Install a lateral.

1. Define the terms equal lateral and unequal lateral.
2. Outline the layout process in developing patterns for an equal lateral.
3. Outline the layout process in developing patterns for an unequal lateral.
4. Fabricate and install a lateral(s) on a shop project.

D. Box Coverings ..... 18 Hours

Outcome: Install box coverings.

1. Identify the terms permanent and removable box coverings.
2. Identify applications for pre-insulated panels.

3. Identify applications for soft cover (blankets).
4. Outline the layout process in developing patterns for removable box coverings.
5. Fabricate and install removable box coverings on a shop project.

SECTION FOUR: .....MATH & BLUEPRINT LEVEL 3..... 56 HOURS

A. Industrial Systems.....12 Hours

Outcome: Interpret mechanical drawings and symbols in an industrial system.

1. Identify symbols on mechanical drawings for an industrial system.
2. Describe the processes of an industrial system.
3. Identify the divisions and their components relating to specifications and addendums relating to an industrial system.

B. Isometric (ISO) and Piping & Instrumentation Diagram (P&ID).....16 Hours

Outcome: Interpret ISO and P&ID drawings for the application of insulating materials.

1. Identify an ISO and P& ID type drawing.
2. Define the abbreviated terms ISO and P& ID.
3. Apply the information found on an ISO drawing.
4. Apply the information found on a P& ID drawing.

C. Material Estimating.....18 Hours

Outcome: Determine quantities of materials by doing a takeoff.

1. Identify the documents required to complete a material takeoff.
2. Demonstrate the ability to interpret specifications and addendums.
3. Demonstrate the ability to interpret various types of drawings.
4. Calculate the total amount, including the wastage factor, of materials ordered.

D. Project Costs.....10 Hours

Outcome: Estimate the project costs to complete a job.

1. Estimate total costs for a given project.
2. Determine the cost at a given price per unit.
3. Estimate the man-hours based on material quantity.
4. Calculate manpower costs.

Apprenticeship and Industry Training

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